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Robin E. Leigh

*Robin E. Leigh*

**PATENT**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Hauptmann et al.

Group Art Unit: Not Assigned

**Serial No.: Not Assigned**

Examiner: Not Assigned

Filed: Herewith

Docket No.: 1406/15

For: TONE SIGNAL DETECTION CIRCUIT FOR DETECTING TONE SIGNALS

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**PRELIMINARY AMENDMENT**

Commissioner for Patents  
BOX PATENT APPLICATION  
Washington, D.C. 20231

Dear Sir:

Kindly amend the subject application as follows:

**IN THE SPECIFICATION:**

Please insert a paragraph heading on page 1 of the English translation of the subject application, line 5, as follows:

--Technical Field --.

Please insert a paragraph heading on page 1 of the English translation of the subject application, line 10, as follows:

--Related Art --.

Please insert a paragraph heading on page 2 of the English translation of the subject application, before line 35, as follows:

--Summary of the Invention --.

Please insert a paragraph heading on page 6 of the English translation of the subject application, line 5, as follows:

--Brief Description of the Drawings--.

Please insert a paragraph heading on page 6 of the English translation of the subject application, before line 28, as follows:

--Detailed Description of the Invention--.

**IN THE CLAIMS:**

Please delete the paragraph heading "Patent Claims" on page 14 of the English translation of the subject application, and insert in place thereof the paragraph heading:

00942513-082004  
100280-37524600

--CLAIMS--

Please insert the paragraph heading on page 14 of the English translation of the subject application, after the above-mentioned paragraph heading and before claim 1, as follows:

-- What is claimed is: --.

Please amend claims 1-17 as follows:

1. (Amended) A tone signal detection circuit for a receiving circuit for detecting at least one signal having a predetermined tone signal frequency ( $f_E$ ) which is contained in a received analog input signal, comprising:

- (a) a reference signal generator for generating an analog converter reference signal  $V_{ref}$  which consists of a reference DC ( $V_{refDC}$ ) and a periodic reference AC ( $V_{refAC}$ ) having a variable fundamental frequency ( $f_G$ ), which is superimposed on the reference DC ( $V_{refDC}$ );
- (b) an analog/digital converter for converting the analog input signal into a digital data stream in dependence on the analog converter reference signal ( $V_{ref}$ ); and comprising
- (c) a digital control circuit which adjusts the variable fundamental frequency ( $f_G$ ) of the reference signal ( $V_{ref}$ ) generated by the reference signal generator in accordance with the predetermined tone signal frequencies ( $f_G$ ) of the tone signals to be detected and evaluates the digital data stream output by the digital analog/digital converter for detecting a data pattern corresponding to the tone signal.

2. (Amended) The tone signal detection circuit as claimed in claim 1, wherein the reference signal generator exhibits a reference voltage source for generating the reference DC ( $V_{refDC}$ ),

a controllable signal generator for generating the periodic reference AC signal ( $V_{refAC}$ ) in dependence on a fundamental-frequency adjusting signal, received by the digital control circuit, for adjusting the fundamental frequency ( $f_G$ ), and an

adder which adds the reference DC ( $V_{refDC}$ ) to the periodic reference AC ( $V_{refAC}$ ) for forming the converter reference signal ( $V_{ref}$ ).

3. (Amended) The tone signal detection circuit as claimed in claim 1, wherein the digital control circuit contains a zero transition counting device which counts the number of zero transitions of the digital data stream output by the analog/digital converter, the digital control circuit detecting a tone signal when the number of zero transitions per time corresponds to a predetermined nominal zero transition rate.

4. (Amended) The tone signal detection circuit as claimed in claim 1, wherein the various nominal zero transition rates of the tone signals to be detected can be adjusted in the digital control circuit.

5. (Amended) The tone signal detection circuit as claimed in claim 1, wherein the digital control circuit contains a comparator circuit with adjustable signal threshold values.

6. (Amended) The tone signal detection circuit as claimed in claim 1, wherein the digital control circuit exhibits a digital band-pass filter for band-pass filtering the digital data stream.

7. (Amended) The tone signal detection circuit as claimed in claim 1, wherein the detected tone signals are temporarily stored in a memory of the digital control circuit.

8. (Amended) The tone signal detection circuit as claimed in claim 1, wherein the digital control circuit outputs a corresponding interrupt signal to a central controller of the receiver circuit, with a predetermined tone signal combination which consists of at least one tone signal.

9. (Amended) The tone signal detection circuit as claimed in claim 1, wherein the analog/digital converter contains a digital filter and a decimation filter.

10. (Amended) The tone signal detection circuit as claimed in claim 1, wherein the received analog input signal is an xDSL signal.

11. (Amended) The tone signal detection circuit as claimed in claim 1, wherein the receiver circuit is a modem receiver circuit.

12. (Amended) The tone signal detection circuit as claimed in claim 11, wherein the modem receiver circuit switches the receiver circuit from a standby mode to a data reception mode by means of the central controller on reception of the interrupt signal from the digital control circuit.

13. (Amended) The tone signal detection circuit as claimed in claim 1, wherein the digital/analog converter is preceded by an anti-aliasing filter.

14. (Amended) The tone signal detection circuit as claimed in claim 13, wherein the anti-aliasing filter is preceded by an automatic gain control circuit.

15. (Amended) The tone signal detection circuit as claimed in claim 1, wherein the digital data stream output by the analog/digital converter is evaluated by a following data processing circuit of the receiver.

16. (Amended) The use of an analog/digital converter as mixing stage for mixing an analog input signal with an analog reference signal.

17. (Amended) The analog/digital converter as claimed in claim 16, wherein the analog/digital converter converts the analog input signal into a digital data stream which is evaluated for detecting an analog tone signal.

#### REMARKS

The amendments to the specification as set forth above are intended to clarify and set apart the various sections of the subject application.

The amendments to the claims as set forth above are intended to remove all multiple dependent claims from the subject application and to more particularly point out and distinctly claim the subject matter of the invention.

Attached hereto is a marked-up version of the specification and claims 1-17, which illustrates all of the changes made to the specification and claims pursuant to 37 CFR §1.121. The attached page is captioned "**Version With Markings To Show Changes Made**". Deleted language is bracketed and added language is underlined.

The Commissioner is hereby authorized to charge any deficiencies or credit any overpayments in connection with the filing of this correspondence to Deposit Account No. **50-0426**.

Respectfully submitted,

JENKINS & WILSON, P.A.

Date: 8-29-01

By:

Richard E. Jenkins  
Richard E. Jenkins  
Reg. No.: 28,428

Suite 1400 University Tower  
3100 Tower Boulevard  
Durham, North Carolina 27707  
Telephone: (919) 493-8000  
Facsimile: (919) 419-0383



25297

PATENT TRADEMARK OFFICE

1406/15

REJ/lsg

**Serial No.: Not yet assigned**

**Version With Markings To Show Changes Made**

**IN THE SPECIFICATION:**

The paragraph heading has been inserted on page 1 of the English translation of the subject application, line 5, as follows:

**Technical Field**

The paragraph heading has been inserted on page 1 of the English translation of the subject application, line 10, as follows:

**Related Art**

The paragraph heading has been inserted on page 2 of the English translation of the subject application, before line 35, as follows:

**Summary of the Invention**

The paragraph heading has been inserted on page 6 of the English translation of the subject application, line 5, as follows:

**Brief Description of the Drawings**

The paragraph heading has been inserted on page 6 of the English translation of the subject application, before line 28, as follows:

**Detailed Description of the Invention**

**IN THE CLAIMS:**

The paragraph heading "Patent Claims" has been deleted and the paragraph heading has been inserted in place thereof on page 14 of the English translation of the subject application, as follows:

**CLAIMS**

The paragraph heading has been inserted on page 14 of the English translation of the subject application, before claim 1, as follows:

**What is claimed is:**

1. (Amended) A tone signal detection circuit for a receiving circuit for detecting at least one signal having a predetermined tone signal frequency ( $f_E$ ) which is contained in a received analog input signal, comprising:

- (a) a reference signal generator [(41)] for generating an analog converter reference signal  $V_{ref}$  which consists of a reference DC ( $V_{refDC}$ ) and a periodic reference AC ( $V_{refAC}$ ) having a variable fundamental frequency ( $f_G$ ), which is superimposed on the reference DC ( $V_{refDC}$ );
- (b) an analog/digital converter [(11)] for converting the analog input signal into a digital data stream in dependence on the analog converter reference signal ( $V_{ref}$ ); and comprising
- (c) a digital control circuit [(20)] which adjusts the variable fundamental frequency ( $f_G$ ) of the reference signal ( $V_{ref}$ ) generated by the reference signal generator [(42)] in accordance

with the predetermined tone signal frequencies ( $f_G$ ) of the tone signals to be detected and evaluates the digital data stream output by the digital analog/digital converter [(11)] for detecting a data pattern corresponding to the tone signal.

2. (Amended) The tone signal detection circuit as claimed in claim 1, wherein the reference signal generator [(41)] exhibits a reference voltage source [(51)] for generating the reference DC ( $V_{refDC}$ ),

a controllable signal generator [(42)] for generating the periodic reference AC signal ( $V_{refAC}$ ) in dependence on a fundamental-frequency adjusting signal, received by the digital control circuit [(20)], for adjusting the fundamental frequency ( $f_G$ ), and an

adder which adds the reference DC ( $V_{refDC}$ ) to the periodic reference AC ( $V_{refAC}$ ) for forming the converter reference signal ( $V_{ref}$ ).

3. (Amended) The tone signal detection circuit as claimed in claim 1 [or 2], wherein the digital control circuit [(20)] contains a zero transition counting device [(28)] which counts the number of zero transitions of the digital data stream output by the analog/digital converter [(11)], the digital control circuit [(20)] detecting a tone signal when the number of zero transitions per time corresponds to a predetermined nominal zero transition rate.

4. (Amended) The tone signal detection circuit as claimed in [one of the preceding claims] claim 1, wherein the various nominal zero transition rates of the tone signals to be detected can be adjusted in the digital control circuit [(20)].

5. (Amended) The tone signal detection circuit as claimed in [one of the preceding claims] claim 1, wherein the digital control circuit [(20)] contains a comparator circuit [(24)] with adjustable signal threshold values.

6. (Amended) The tone signal detection circuit as claimed in [one of the preceding claims] claim 1, wherein the digital control circuit [(20)] exhibits a digital band-pass filter [(22)] for band-pass filtering the digital data stream.

7. (Amended) The tone signal detection circuit as claimed in [one of the preceding claims] claim 1, wherein the detected tone signals are temporarily stored in a memory [(32)] of the digital control circuit [(20)].

8. (Amended) The tone signal detection circuit as claimed in [one of the preceding claims] claim 1, wherein the digital control circuit [(20)] outputs a corresponding interrupt signal to a central controller [(36)] of the receiver circuit, with a predetermined tone signal combination which consists of at least one tone signal.

9. (Amended) The tone signal detection circuit as claimed in [one of the preceding claims] claim 1, wherein the analog/digital converter [(11)] contains a digital filter and a decimation filter.

10. (Amended) The tone signal detection circuit as claimed in [one of the preceding claims] claim 1, wherein the received analog input signal is an xDSL signal.

12. (Amended) The tone signal detection circuit as claimed in [one of the preceding claims] claim 11, wherein the modem receiver circuit switches the receiver circuit from a standby mode to a data reception mode by means of the central controller [(36)] on reception of the interrupt signal from the digital control circuit [(20)].

13. (Amended) The tone signal detection circuit as claimed in [one of the preceding claims] claim 1, wherein the digital/analog converter [(11)] is preceded by an anti-aliasing filter [(8)].

14. (Amended) The tone signal detection circuit as claimed in [one of the preceding claims] claim 13, wherein the anti-aliasing filter [(8)] is preceded by an automatic gain control circuit [(5)].

15. (Amended) The tone signal detection circuit as claimed in [one of the preceding claims] claim 1, wherein the digital data stream output by the analog/digital converter [(11)] is evaluated by a following data processing circuit of the receiver [(17)].

16. (Amended) The use of an analog/digital converter [(11)] as mixing stage for mixing an analog input signal with an analog reference signal.

17. (Amended) The analog/digital converter as claimed in claim 16, wherein the analog/digital converter [(11)] converts the analog input signal into a digital data stream which is evaluated for detecting an analog tone signal.

## Addendum

1. TONE SIGNAL DETECTION CIRCUIT FOR DETECTING TONE SIGNALS

TOP SECRET